

## **REMARKS**

Currently claims 37-43 are pending. Claims 44-53 have previously been withdrawn. Herein amendments have been made to claim 37 to better clarify the claimed invention. No new matter has been added by way of this amendment.

### **Rejection – Claims 37-43 under 35 USC § 112, second paragraph – Indefiniteness**

The Examiner has rejected claims 37-43 under 35 USC §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. Specifically, the examiner states that it is “unclear what constitutes ‘genes of the flavonol biosynthetic pathway’” as the term is presented in claim 37.

Applicants respectfully disagree with the Examiner and point to page 9, lines 14-17 of the specification. These lines cite genes occurring in the flavonol biosynthetic pathway: CHS-A, CHS-B, CHI, F3H and FLS. Again in Table 2 on page 11, it is shown what genes Applicants cite as being within the flavonol biosynthetic pathway. The three accessions cited throughout the specification and in the pending claims, LA1963, LA2884 and LA1926 have all of these genes present in their flesh. While Applicants believe the claims to be definite as written, in the interest of expedited prosecution, Applicants have nevertheless amended claim 37 to specifically cite the genes that must be present in the flesh. Therefore, Applicants believe this rejection be overcome and respectfully request that it be withdrawn.

### **Rejection – Claims 37-43 under 35 USC §103 - Obviousness**

The Examiner has rejected claims 37-43 under 35 USC §103 as being unpatentable over Goffreda, in view of Muir et al, in view of Peralta et al, in view of Allard. The Examiner states that “[t]he claims read on a method of making a hybrid *Lypersicon* plant expressing flavonol in the peel and flesh of the fruit of said plant by crossing a wild *Lypersicon* species that expresses *CHI* in the peel and that expresses genes of the flavonol biosynthetic pathway in the flesh with a *L. Esculentum* plant to produce said hybrid plant and hybrids produced thereof.”(page 4, OA dated 6/17/09). Applicants initially note that the amended claims now comprise the additional limitation “, wherein said genes of the flavonol biosynthetic pathway comprises *CHS*, *CHI*, *F3H* and *FLS*.”

The Examiner continues on the following page, further stating that “[t]he claims read on an interspecific cross between two species of *Lycopersicon* wherein a desirable gene from the wild

*Lycopersicon* species is introgressed into the *L. Esculentum* to produce a hybrid plant having the desired gene.” (page 5, OA 6/17/2009) Applicants point out that this is **NOT** an accurate statement of the claimed subject matter. The pending claims do **NOT** read on the introgression of “a desirable gene”. The claims read on the introgression of **specific** genes from wild *Lycopersicon* species. The Examiner’s statement regarding what the claims read on in as an inaccurate, overly broad statement that impermissibly reduces the threshold for obviousness by reading breadth into the claims that does not exist. Applicants will argue against the Examiner’s obviousness rejection based on the first characterization of the claimed subject matter made by the Examiner on page 4.

The Examiner cites Allard for showing that “the state of the art teaches that interspecific crosses are used to improve tomato plants by introgressing desired genes from wild species of *Lycopersicon* into *L. Esculentum*. (Page 5) The Examiner further cites Goffreda for teaching “a method of making a hybrid *Lycopersicon* plant by crossing a wild *Lycopersicon* species with a *L. esculentum* plant.” (Page 5) The Examiner next cites Muir for teaching the importance of *CHI* in the flavonol biosynthetic pathway. (Page 6) Finally, the Examiner cites Peralta for teaching “accessions of wild *Lycopersicon* species, including LA1963, LA2884 and LA1926. (Page 6)

Applicants respectfully traverse the Examiner’s rejection and argue that the references cited by the Examiner and the arguments based thereon do not give rise to a *prima facie* case of obviousness. The Examiner has highlighted some of the rationale from the relatively recent KSR case. However, as noted in *KSR* and stated in MPEP 2143:

“To reject a claim based upon this rationale, Office personnel must resolve the *Graham* factual inquiries. Then, Office personnel must articulate the following: (1) a finding that the **prior art included each element claimed**, although not necessarily in a single prior art reference, with the **only** difference between the claimed invention and the prior art being the lack of actual combination of the elements in a single prior art reference;” (emphasis added)

The Examiner has failed to provide a combination of references that includes **each element of the claimed** invention. The claimed method includes four essential elements: (1) a wild *Lycopersicon* species expressing *CHI* in the peel and the genes of the flavonol biosynthetic pathway in the fruit flesh, (2) a domesticated *L. esculentum* plant, (3) crossing said wild and domesticated plant and (4) obtaining as a result a hybrid *Lycopersicon* plant that expresses *CHI* in the peel and the genes of the flavonol biosynthetic pathway in the fruit flesh.

Only one reference that the Examiner has provided, the Muir reference, even discusses *CHI* and flavonol accumulation. Yet, Muir only describes a **transgenic** approach to transferring *CHI* from

Petunia into the **peel only** of a domesticated tomato and does not provide a method for transferring **all** genes of the biosynthetic pathway into the fruit flesh of a hybrid tomato plant as contemplated by the claimed invention. None of the remainder of the references cited by the Examiner even discuss *CHI* expression and the accumulation of flavonols, let alone teach the transference of the genes included in the instant claims, i.e. *CHI*, *CHS*, *F3H* and *FLS*, via **breeding** techniques from a wild *Lycopersicon* to *L. esculentum*.

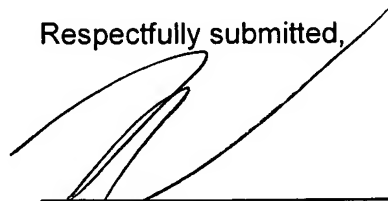
In actuality, not a single reference cited by the Examiner, not even the Muir reference, mentions the importance of the genes of the flavonol biosynthetic pathway (*CHI*, *CHS*, *F3H*, *FLS*) in tomato fruit flesh or the transference of these genes into the fruit flesh of a wild *Lycopersicon* x *L. esculentum* hybrid tomato plant. The Muir reference, which is the only reference of the four that contains any information regarding any specific aspect of the claimed invention (the *CHI* gene in the **peel**), specifically states that all of their work was done with the peel of the tomato and that “[t]ranscripts of the *chs*, *chi*, and *fls* genes were undetectable in fruit flesh” (Muir, pg 471) prior to transformation and that even after transformation “[t]otal flavonoids did not accumulate above control levels in the fruit flesh or leaves of any of the pBBC50 transformants tested” (Muir, pg 471). Muir appears to place no importance on the need for the flavonol biosynthetic pathway in the flesh of the fruit, indicating in their conclusion that they believed the transgenically created tomatoes, accumulating flavonols only in the peel, could prove useful in providing “tomato-based products with an expanded range of potential health benefit properties.” (Muir, pg. 471). Whereas, in contrast, Applicants, fully aware of the Muir reference indicated by its citation on page 2 of the instant specification, specifically address the “need to produce domesticated tomato plants, using traditional breeding techniques, that accumulate significant amounts of flavonols in the peel, **as well as in the flesh**, of the tomato fruit. (specification, pg.3, Ins 5-7, emphasis added). The combination of the four essential elements of the claimed method simply does not exist in the prior art cited by the Examiner.

Thus, Applicants submit that the Examiner has failed to establish a *prima facie* case of obviousness as the cited references do not contain each and every element of the claimed invention as required by MPEP 2143 in the wake of *KSR*. The cited references do not disclose, neither individually nor in combination, a method of making a hybrid *Lycopersicon* plant expressing flavonol in the peel and flesh of the fruit of said plant by crossing a wild *Lycopersicon* species that expresses *CHI* in the peel and that expresses genes of the flavonol biosynthetic pathway in the flesh with a *L. esculentum* plant to produce said hybrid plant, wherein said genes of the flavonol biosynthetic pathway comprise *CHS*, *CHI*, *F3H* and *FLS*. Therefore, Applicants respectfully request that this rejection be withdrawn.

## CONCLUSION

Applicants respectfully submit that all outstanding issues in the present case have been addressed in this paper. Applicants request continued prosecution on the merits and allowance of the claims as presented herein. In the event issues remain that could be dealt with on the telephone, the Examiner is encouraged to call the undersigned attorney for Applicants at 919-765-5117.

Respectfully submitted,



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